

Remote Water Level Monitoring Technical Note

Product: HOBO® RX3000 Station

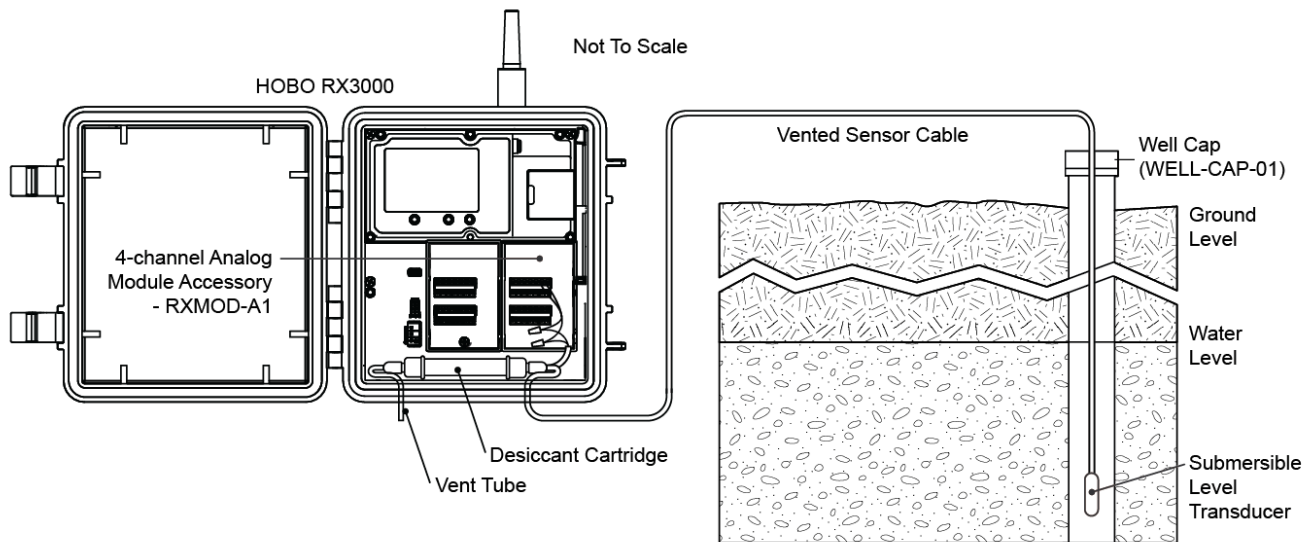
Summary: This technical note provides details on configuring the HOBO RX3000 Remote Monitoring Station with water level sensors with a 4-20mA output.

The combination of the RX3000 station and one or more third-party water level sensors with 4-20mA analog outputs provides a solution to remotely monitor water level and to access data using the internet. This system can also send notifications when it reaches critical levels. Typical applications include monitoring wells, groundwater, surface water, storm water, and storm surges.

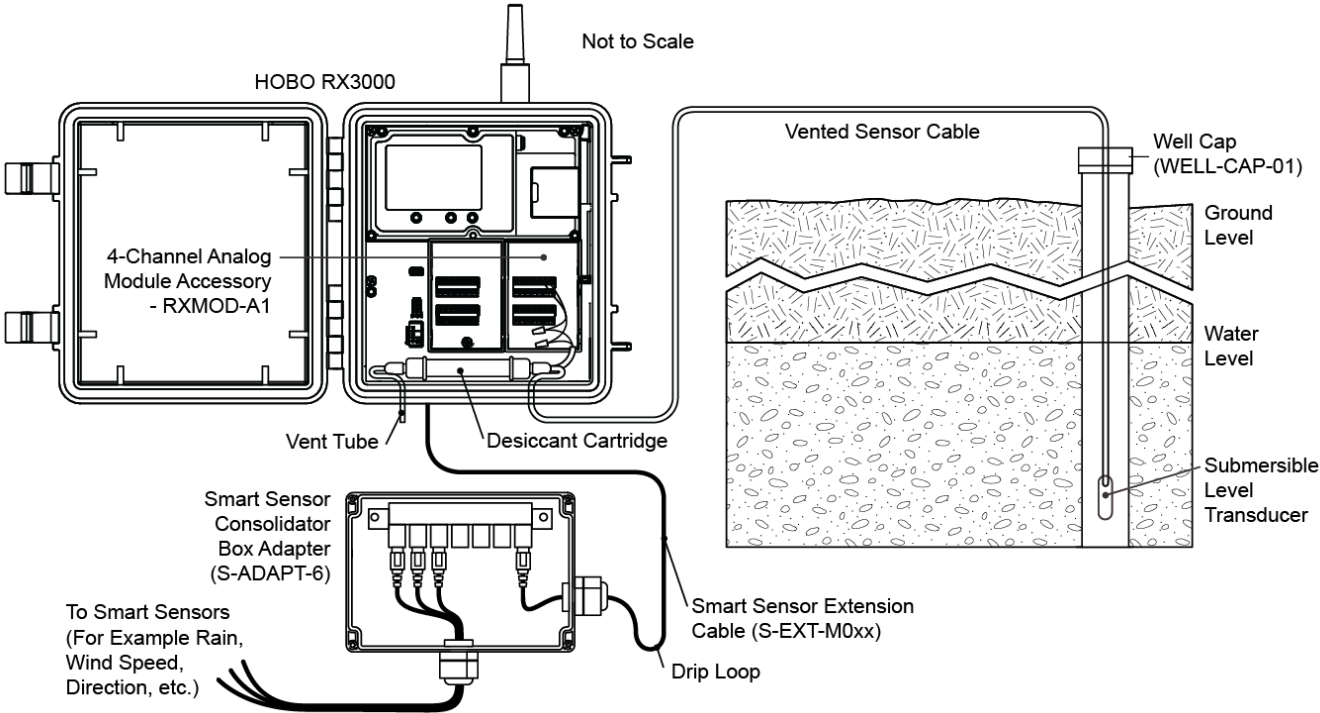
Deployment/Mounting Tips

Follow these guidelines for deploying and mounting a water level sensor for use with an RX3000 Station.

- When mounting the sensor in a well, use the Onset well cap (WELL-CAP-01). Drill a hole through the top of the cap to insert the sensor cable. Use a hose clamp around the cable as a stopper to suspend the cable.
- Be sure the well with the water level sensor has a hole that vents to the atmosphere.
- For accurate measurements, use a desiccant cartridge to keep moisture out of the vent tube. Locate the desiccant cartridge inside a vented, weatherproof enclosure. Install the weatherproof cable channels in both channel openings in the bottom of the RX3000 station. Route the vent tube to the atmosphere through one of the weatherproof sensor cable openings.
- The desiccant cartridge can fit inside the RX3000 enclosure as shown in the following diagram, as long as the desiccant is no more than 11 cm (4.5 in.) long.



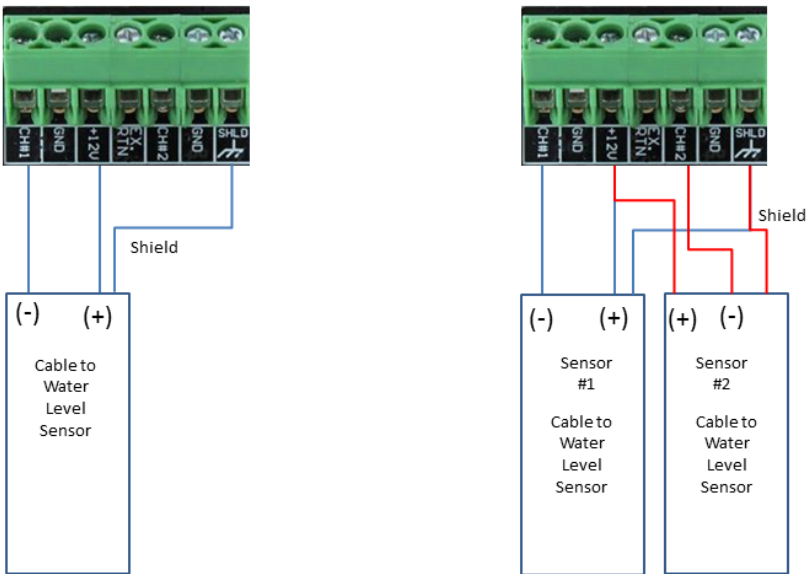
- If you are using other smart sensors (rain gauge, wind speed/directions, barometric pressure, etc.) in addition to the water level sensor, you may need to use a smart sensor consolidator box adapter (S-ADAPT-6) and a smart sensor extension cable (S-EXT-M0xx).



- Before connecting your water level sensor to the RX3000 station, route the cable through openings as needed. Specifically, if the cable needs to go through a well cap, make that connection before connecting the wires. Also make sure that the cable is coming through one of the cable openings in the bottom of the RX3000.

Connecting a Water Level Sensor that Can Operate from 12V Power

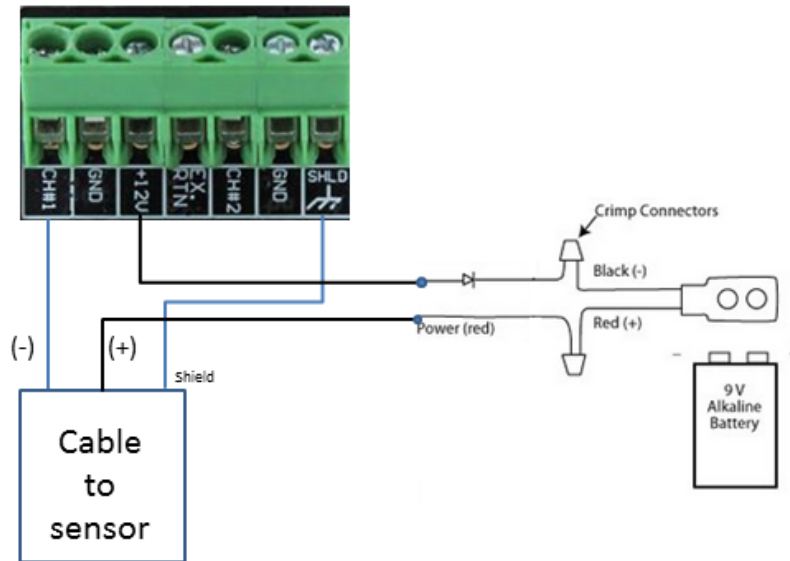
Connect as shown below.



Configuration with Sensors that work with a 12V Power Supply

Connecting a Sensor that Requires More than 12 Volts

Some water level sensors need excitation power higher than the 12 volts the RX3000 provides. The diagram below shows how to use a 9V battery to boost the 12V excitation of the RX3000. This configuration requires a 9V battery connector such as Radio Shack Model 270-325, and a diode rated for at least 50mA and 20V, such as a 4148 diode or a 5817 Schottky diode. With a 1 minute logging rate and 30ms warm-up time, a good 9V battery should last for over a year in this configuration. Onset recommends replacing the battery annually to be safe.



Analog Sensor Module Connections using a 9V Battery to Boost the Output Voltage

Configuring Analog Sensors in HOBOLink

1. In HOBOLink, select Devices then tap the wrench icon on your station's tile.
2. Select Analog Sensors Logging.
3. Set the Logging Interval, Sampling Interval (if desired), and select Use Excitation Power. Select Warmup and enter 0 seconds and 500 milliseconds. To save power, you can use a shorter warm-up time with some water level sensors. Check with the sensor manufacturer for the minimum warm-up time.
4. Scroll down to Sensor Configuration. Select Enable channel.
5. Under Sensor/Input Type, select T-SDX-93720 with the appropriate range.
6. Tap Save. These changes will be transmitted to the station the next time it connects to HOBOLink. Press the Connect button on the station if you want it to connect to HOBOLink immediately.
7. Press the Start button on the station to begin logging when ready (if it isn't already logging).
 - If you are using the sensor to monitor sensor depth, the steps are complete.
 - If you are using the sensor to monitor water level, continue with step 8.
8. Make sure the water level sensor is deployed in position and the station is logging. Make a reference level reading and note the time. For example, if you are using an on-site gauge as your reference, read the staff gauge to get your reference reading.
9. In HOBOLink, create an export with data from this sensor.
 - a. Select Data and then Exports.
 - b. Select the Device Name and Measurement Type. Make sure you select a Date Range that includes the time you took the reference level reading in step 8.

- c. Tap Create New Export. Complete the export details and tap Save.
10. Open the file that contains the exported data. Find the logged data point in the exported file with the closest time to your reference level reading. Subtract this value from the reference level reading that you took in step 8.
11. Return to the Sensor Configuration screen (in HOBOLink, select Devices, then tap the wrench icon on your station's tile. Scroll down to Analog Sensors Logging, select the channel with the Stevens sensor).
 - a. Tap Enable Scaling.
 - b. Add the offset value to the Scaled Water Level Units for both Scaled Low and Scaled High. For example, with an offset value of 2 and using the example in step 5, you would change Scaled Low to 2 and Scaled High to 12 (it is ok to round to 12 instead of adding exactly 2 and entering 12.00000031914297).
 - c. Type the name of the data series in the Scaled Measurement Type field (for example, Scaled Water Level).
12. Tap Save. These changes will be transmitted to the station the next time it connects to HOBOLink. Press the Connect button on the station if you want it to connect to HOBOLink immediately.